INTRAUTERINE GROWTH RESTRICTION (IUGR)

by R. Perkins

Definition

An intrauterine growth–restricted infant is one whose weight is significantly below normal for gestational age as defined by normal expectations for that fetus.

Incidence

It is expected that 5—10 percent of a population will fall into this category at any one time, but practically, if tables reflecting gestational age and weight relationships for other populations are used, the incidence may vary from about 5 to 15 percent. The importance lies in the recognition and management of the problem before, during, and after birth. IUGR, when due to causes in the fetus alone (as with infection or chromosome abnormality) is usually untreatable. These babies make up most of the group with the very bad outcomes, but are a small proportion of all cases of IUGR. When due to placental insufficiency, the potential for a satisfactory outcome is much better, if the situation is recognized and properly handled.

Significance

Growth–restricted infants are at risk for moderate to marked perinatal mortality and morbidity. In some cases, where the cause is known, the morbidity to the fetus may be anticipated as a reflection of the severity of the maternal disease. In other cases, constituting about 50 percent of all cases of growth restriction, no obvious cause can be determined and therefore the risk, except as involved in selecting the optimal mode of management, is entirely fetal and neonatal. Growth–restricted infants are at a somewhat increased risk of in utero demise, but in most cases this risk is significant only near or past term or when the condition goes totally unrecognized. Growth–restricted infants whose IUGR is due to placental insufficiency have been shown to have at least a 30 percent incidence of hypoxic distress during labor, and therefore the highest degree of vigilance is required during the labor process. Neonatally, hypoglycemia, hypothermia, hypocalcemia, polycythemia, and related problems are of greatest concern. All of these problems may attain greater significance when combined with birth asphyxia. The growth–restricted infant demands a high degree of neonatal management skill. Because of this, such babies should be anticipated where possible, and their births not conducted where neonatal management facilities are inadequate to deal with their special requirements.

Diagnostic Evaluation

Since growth of the fetal heart and brain is generally favored over growth of most other body organs, failure of the biparietal diameter to grow along an appropriate curve as determined by ultrasound is a potentially ominous and significant finding. It is probably more accurate to follow growth of the head in relation to the chest or abdomen if standard tables are used. Failure of somatic growth to remain appropriate and proportional suggests growth restriction when the abdominal circumference is smaller on serial determinations than expected for the apparent gestational age. This circumstance defines asymmetric IUGR. Failure of biparietal growth to occur normally in late gestation, if other growth is also inadequate, implies a severe degree of growth impairment and a significant risk of fetal death or morbidity. Inadequate fundal growth will usually also be associated with diminished amniotic fluid volume. Estimation of amniotic fluid volume is crucial to assessing fetal status chronically, as fetal activity, breathing, movement, and tone is to assessing it acutely.

* *Management*

Prenatal

As indicated above, a high index of suspicion for growth restricted infants should exist with multiple pregnancy, chronic hypertension, chronic renal disease, long—standing insulin—dependent diabetes mellitus, and a suspicion of fetal anomaly. When coupled with the observation of poor uterine growth after 26 weeks, slow or absent growth on ultrasound, and low—normal or low amniotic fluid volume, this should suggest the diagnosis of probable IUGR. The incidence of such findings is also increased at high altitudes. Should the diagnosis be associated with contributing maternal disease, management is conducted in concert with control of the maternal condition. In the absence of obvious contributing causes, control of the maternal environment, such as with bed rest and adequate caloric intake, is indicated. These high–risk patients are best managed in consultation with or by an obstetrician together with the physician primarily involved in the medical care of the patient.

Serial ultrasound examinations for growth (no more frequently than every 2-3 weeks), coupled with twice weekly nonstress testing (NST) and amniotic fluid index (AFI), may anticipate otherwise unexpected deterioration in the tolerance of the fetus for its adverse intrauterine environment. Biophysical profiles (BPP) may be recommended by the regional consultant. Weekly scans for amniotic fluid volume are helpful if a reduction (oligohydramnios) is to be successfully anticipated.

Questions concerning the duration of gestation (distinguishing growth restriction from unexpected prematurity) can be addressed by amniocentesis for phosphatidylglycerol and L/S ratio at 37-38 estimated weeks. In the truly growth–restricted infant, one or both values should be mature in almost every case, whereas with unexpected prematurity, it would be expected that they might be immature. The presence of adequate fluid volume is usually a clue to misdating, or to a symmetrically growth–restricted fetus due to infection, anomaly, intoxication, or chromosomal abnormality. In true asymmetric IUGR, elevated cord arterial flow velocity wave form analyses (S/D ratios) by doppler wave flow ultrasound exam may also be found where obtainable.

Observation of the degree of fetal activity as recorded by the mother may be of substantial help in anticipating deterioration in fetal status. Diminished or absent fetal movement over a period of observation requires a vigorous attempt at confirming continued welfare. Serial antenatal testing should be helpful in defining the necessary course of action. Despite considerable sentiment to the contrary, there is as yet no hard evidence that intervention prior to objective evidence of intolerance of the in utero environment (as with a nonreactive NST and an abnormal BPP) spares damage. A combination of growth restriction and prematurity may, in fact, be more devastating to long-term neurologic well-being than is growth restriction alone.

* *Intrapartum*

The contraction stress test under any clinical circumstances has a substantial incidence of false positivity (fetuses who fail to show late decelerations during normal labor as compared to the oxytocin-produced contractions). Nonetheless, with a high index of suspicion, a positive CST or abnormal BPP or an AFI <5 cm suggests the need for delivery. If vaginal delivery is not felt to be an easy and safe method, cesarean delivery should be used.

Since the risk to the fetus of distress and demise during labor is increased, adequate electronic fetal monitoring should be instituted at the earliest opportunity. Any signs of hypoxic distress, especially when occurring in a premature and growth–restricted infant, indicate that expedient delivery is necessary. It has been shown that prolonged hypoxia combined with growth restriction

magnifies the risk of respiratory distress and neonatal morbidity and mortality. In the interests of neonatal welfare, cesarean delivery should be used liberally under these circumstances.

The principles of management of late decelerations occurring in labor are well established, and have been covered in the chapter on Fetal Monitoring. Absence of baseline variability in the unmedicated mother is an ominous sign, particularly when combined with baseline tachycardia. The mother should be repositioned on her side and administered oxygen by mask, and any other situation contributing to circulatory and/or oxygenation deficit corrected. If this does not rapidly eliminate late decelerations and restore normal variability, expedient delivery should be undertaken. Alternatively, fetal scalp blood gas determinations or fetal tactile or acoustic stimulation can be performed to identify acidosis in fetuses who demonstrate late decelerations. Severe variable decelerations are also more common in these labors, due in large part to the reduced amniotic fluid volume and the resulting absence of cord protection. The proper management of these cases may involve the use of amnioinfusion.

* *Neonatal*

The management of the neonate is the province of the pediatrician, who should be present at the delivery. A careful examination of the baby and placenta for possible contributing causes of the growth restriction should be made. A mother delivering a growth–restricted infant has statistically a three-to fourfold likelihood of similar developments in subsequent pregnancies. Patients should be made aware of this fact if they are considering future childbearing. Since severe anomalies are more frequent among a population of growth–restricted infants, these should be sought both before and after delivery, and appropriate actions, including genetic counseling, should be undertaken.